# Large-Scale Webcasting

## Macworld Keynote Case Study

Session 714

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## Macworld Keynote Case Study

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# The Process

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# The Process

- Network requirements
- Configure hardware and software
- Assemble team
- Preparation
- Test
- The event
- Post event

# Network Requirements

- Bandwidth availability
- Traffic expectations
- Bit rates
  - Targeting for specific connection speeds
- Provision Akamai server ports
- Backup plan

# Hardware and Software

- Determine current hardware and software
  - XServes
  - MPEG-2 recorder
  - Processing and distribution amplifiers
  - DV converter boxes
  - QuickTime Broadcaster 1.01
  - QuickTime Pro 6.3
  - BBEdit (text editor)
  - QuickTime scripts and tools from Apple website
  - Transmit (FTP Software)

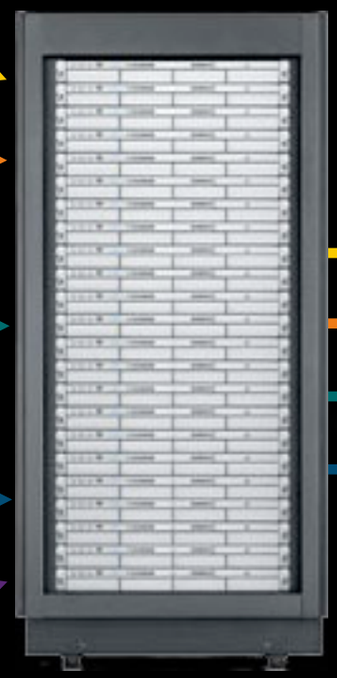
# Hardware and Software

MPEG-2 recorder

Processing amplifier

Distribution amplifier

DV Converters



Akamai Cloud

# Hardware and Software

- Test hardware
  - Firewire ports
  - USB ports
  - Disk space available
- Configure broadcaster settings
  - Test
  - Copy to all machines
- Backup plan

# Assemble Team

- Akamai engineering
- QuickTime engineering
- Product marketing
- Apple PR
- Apple web team
- Apple internet services
- Television production contractors
- Encoding partner

# Preparation

- SDP files
- ARLs
- Reference movies

# Reference Movies

# Test

- Annotations
- Data rates and swing
- Reference movies
- Spliced graphic
- Packet loss

# The Event

- Conference call
- Test
- Restart Broadcasters
- Record MPEG-2 and Betacam SP
- Push event live
- Watch bandwidth consumption
- Report numbers

# Post-Event

- Rebroadcast
- Compress VOD
- Post VOD
- Change web pages
- Reporting and analysis

# Akamai

**William Weihl**
CTO, Akamai Technologies
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# What You'll Learn

- Akamai Technologies and large-scale webcasting
- Partnership between Apple and Akamai
- "Akamaizing" the Apple KeyNote: Case Study
- Summary and Q&A

# Akamai Today

## Extending and controlling e-business infrastructure

- Leading streaming, content and application delivery service
- Value: Improve Web user experience at lower cost
- World's largest globally-distributed computing platform
- 994 recurring customers today; $145MM in annual revenue
- 7 patents filed and 50 patents pending

# An Akamai Extended Infrastructure Enables Customers to Be…

- Always on
  - 100% availability guaranteed
- Always globally available
  - Continuous global presence
  - 15000 servers in 1100 networks in 68 countries
- Always scalable
  - Peak load served: 30+ Gbps and 23 billion hits in 1 day
- Always comfortable
  - Nearly 1000 customers
    15 to 20 billion hits per day
- Always informed
  - Capturing and managing global internet intelligence

# The Akamai Platform for Large-scale Streaming

**15,000**
**Servers**

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**1,100**
**Leading Carriers**
**Hosting, Access, Backbones and Broadband**

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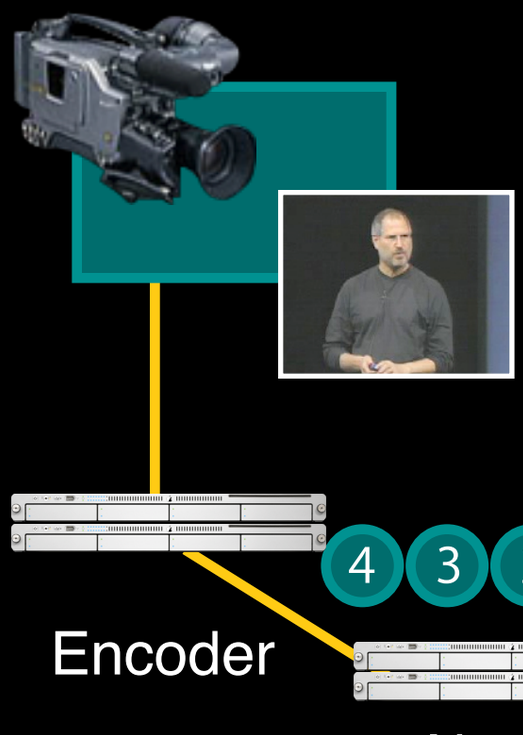
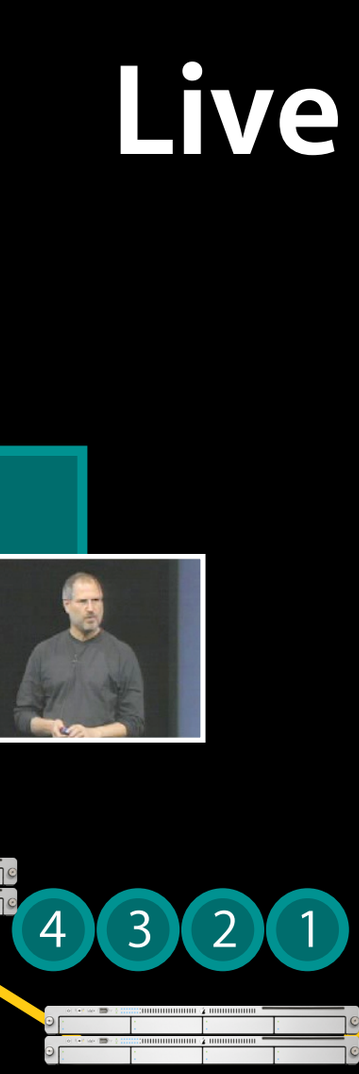
**68**
**Countries**

# Live Streaming With Akamai



Encoder



Akamai
Entry Point

Akamai
Reflectors

Akamai
Edge Servers

# The Apple-Akamai Partnership

- Apple has been a flagship Akamai customer since 1999
- Akamai is Apple's Platform for QuickTime Streaming Network
  - Over 1000 live and on-demand events since 1999
  - 9 live Steve Jobs Keynote Addresses
- Outside of streaming, Akamai delivers for Apple:
  - iTunes Music Store
  - Movie Trailer downloads
  - Software updates
  - Web Analytics services
  - Geolocation services

# Case Study

## Akamaizing Apple's Keynote

**Before the Event** → **Day of the Event**

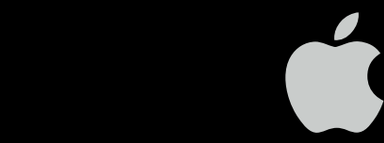
- Develop project plan (Akamai)
- Capacity planning
- Determine need for "Velvet Rope"
- Capability for global load balancing
- Testing

- Provide automated network management
- Monitoring through Akamai network Operations control center
- Custom monitoring through Akamai Situation Room

# Results

## Jan 2003 Apple Keynote

- Expertise delivered:
  - Access to a world-class organization that has delivered some of the Internet's largest streaming events
- Reliability delivered:
  - 100% availability
- Scalability delivered:
  - 12+ Gbps peak delivery to 78,000+ concurrent users, while maintaining the highest level of service to all other customers
- Reporting delivered:
  - Real-time reporting and traffic analysis



# Wrap Up

# Roadmap—Wednesday

| | Russian Hill | Pacific Heights | Haight/ Ashbury | SOMA |
|---|---|---|---|---|
| 9:00 | 711 Audio and QuickTime | | 712 QuickTime for the Web | 713 Introduction to QuickTime Interactivity |
| 10:30 | | | 714 Large-Scale Webcasting: Macworld Keynote Case Study | 715 QuickTime Interactivity Tools |
| 12:00 | | | | |
| 2:00 | 716 Advanced QuickTime Programming Techniques | | 717 3GP: Myth Versus Reality | 718 AppleScript and QuickTime |
| 3:30 | | | 719 Administering QuickTime Streaming Server | 720 Content Creation for Mobile Phones: Top 10 Success Factors |
| 5:00 | | | 721 WiFi and 3G: Let the Games Begin | 722 Advanced QuickTime Interactivity |

# Roadmap—Thursday

| | The Mission | Haight/ Ashbury | SOMA |
|---|---|---|---|
| 9:00 | | 723 The Real Story About MPEG-4 Visual Licensing | 724 What's New With QuickTime VR? |
| 10:30 | | 725 QuickTime and Enhanced CDs | 726 Cutting-Edge Projects Using QuickTime VR |
| 12:00 | | | |
| 2:00 | 727 QuickTime Streaming Server Programming | 728 Produce a Listening Party With QuickTime | 729 Industrial-Strength Encoding |
| 3:30 | | FF011 QuickTime Feedback Forum | |
| 5:00 | | | |

# Roadmap—Friday

| | Pacific Heights | The Marina |
|---|---|---|
| 9:00 | | |
| 10:30 | 730 QuickTime Alternative Programming Environments | |
| 12:00 | | |
| 2:00 | | 731 Internet Application Development: The New Frontier |
| 3:30 | | |
| 5:00 | | |

# Who to Contact

**William Weihl**
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**Guillermo Ortiz**
QuickTime Technology Manager
quicktimeman@apple.com

http://developer.apple.com/wwdc2003/urls.html

# Reference Library

## Tools & Resources

### QuickTime Broadcaster

http://www.apple.com/quicktime/download/broadcaster/

### QuickTime Streaming

http://www.apple.com/quicktime/tools_tips/tutorials/streaming.html

### HTTP vs. RTSP

http://www.apple.com/quicktime/tools_tips/tutorials/httpvsrtsp.html

### QuickTime AppleScripts

http://www.apple.com/applescript/quicktime/

### QuickTime Tools & Utilities

http://developer.apple.com/quicktime/quicktimeintro/tools/

# Reference Library

## Documentation

### General Information

http://www.apple.com/quicktime

### Developer Information

http://developer.apple.com/documentation

### QuickTime Information

http://developer.apple.com/QuickTime

# Do Not Miss!

## Lab: QuickTime Content Creation

Meet with QuickTime content experts for daily content specific topics that are of special interest to you. Bring your own media and PowerBook. No appointment is needed—first-come, first-served.

**Sacramento Room**

## Lab: QuickTime Development

Meet with Apple's QuickTime engineers. Each day will emphasize a specific QuickTime development topic. Bring your own code and PowerBook. No appointment is needed—first-come, first-served.

**Sacramento Room**

## Lab Hours

| | |
|---|---|
| Monday | 12:00pm to 6:00pm |
| Tuesday | 9:00am to 6:00pm |
| Wednesday | 9:00am to 6:00pm |
| Thursday | 9:00am to 4:30pm |
| Friday | 9:00am to 6:00pm |

# Q&A

**Dennis Backus**

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http://developer.apple.com/wwdc2003/urls.html

# WWDC 2003

Worldwide Developers Conference